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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/339,869	06/25/1999	JUN KOIDE	35.C13613	3159

5514 7590 11/29/2002

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 NEW YORK, NY 10112

EXAMINER

TUGBANG, ANTHONY D

ART UNIT	PAPER NUMBER
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3729

DATE MAILED: 11/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/339,869

Applicant(s)

KOIDE ET AL.

Examiner

Dexter Tugbang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment***

1. The applicants' amendment filed 9/10/02 (Paper No. 16) has been fully considered and made of record.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 6-9 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated European Patent Publication EP 0 309 146, referred to hereinafter as EP'146.

EP'146 discloses a method of processing an ink discharge port for manufacturing an ink jet head comprising: closely contacting a mask plate 12 (in Fig. 2) having openings 13 corresponding to discharge ports on a discharge port plate 14 with a face of the discharge port plate 14 on an ink discharge side; and forming the discharge port on the discharge port plate by irradiating a high energy ultraviolet excimer laser simultaneously through the mask plate so that the laser is inclined with respect to a vertical axis that is perpendicular to the mask plate 12 (see col. 5, lines 42+). In Figures 1 and 3, the discharge ports are shown to have a shape, which is widened to a dimension or direction away from a source 11 of the beams. It is noted that the discussion of EP'146 that the excimer laser produces a uniform collimated laser (at col. 4, lines

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2-7) from a source 11, is interpreted that this laser can be inherently said to have more than one UV beam, i.e. plural high energy ultraviolet beams.

With regards to Claims 2, 3, 8 and 9, EP'146 further teaches that the symmetry of incident beams clearly indicates that the incident beams are symmetrical, have the same angle (angle  $\theta$  in Fig. 3), and are equally divided with respect to the vertical axis (vertical line dividing angle  $\theta$  in Fig. 3). Further regarding Claims 3 and 9, EP'146 additionally teaches a division of beams that is within a "circumference of a circle" as indicated by dashed lines in Figure 3.

With regards to Claim 7, EP'146 further discusses forming the discharge ports after bonding of the discharge port plate to the ink jet main body 16 (see col. 4, lines 40-46).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 5-11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP'146 in view of Nishiwaki et al 5,263,250, referred to hereinafter as Nishiwaki'250.

Regarding Claims 1-3, 6-9 and 15, if applicants' believe that EP'146 does not inherently teach that the excimer laser produces a plurality of high energy ultraviolet beams, then alternatively, Nishiwaki'250 suggests that discharge ports can be formed on a discharge port plate with a mask directly or closely contacting the discharge port plate (see col. 1, lines 15-24). Nishiwaki'250 shows at least 6 beams (in Fig. 2) to simultaneously form discharge ports for the

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advantages of efficiently manufacturing the discharge port plates with a reduction in manufacturing costs and time (see col. 6, lines 55+).

In the alternative, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of EP'146 by forming the discharge ports in the discharge port plates with a plurality of high energy ultraviolet beams, as taught by Nishiwaki'250, to positively reduce the overall manufacturing time and costs of the discharge port plates.

With regards to Claims 5 and 11, to choose any desired specific angle of irradiation of the incident beams in relationship to the arrangement direction of the discharge port is an obvious matter of design choice, since the Applicants have not disclosed that the claimed *angle of 45 °* solves any stated problem or is for any particular purpose, and it appears that the invention would perform equally well with the various angles of incident beams taught by either EP'146 or Nishiwaki'250.

6. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP'146 in view of Nishiwaki'250 as applied to Claims 6 and 11 above, and further in view of Japanese Patent Publication JP 2-187346, referred to hereinafter as JP'346.

EP'146, as modified by Nishiwaki'250, discloses the claimed manufacturing method as relied upon above. The modified EP'146 method does not teach that 1) the ink flow paths are rectangular in shape, and 2) that the discharge port plate is formed by a material of resin.

JP'346 shows an ink jet head in which corresponding ink flow paths 14 (in Fig. 9) are rectangular in shape and are connected to a discharge port plate 10. JP'346 teaches that the discharge port plate is made of a resin material, which is ablated by laser beams to form the

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discharge ports 11, and that the rectangular ink flow paths 14 are formed by the laser beams after the discharge ports are formed (see Purpose). An advantage of the above process and material provides the necessary amount of jet-out speed for the ink drops onto a medium, i.e. paper (again, see Purpose).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have improved the modified method of EP'146 by forming the ink flow path rectangular in shape and the discharge port plate with a resin material, as taught by JP'346, to positively provide an operational ink jet head with the necessary amount of jet-out speed for the ink drops onto the medium.

7. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP'146 in view of Nishiwaki'250 as applied to Claim 6 above, and further in view of Muto 5,548,894, referred to hereinafter as Muto'894.

EP'146, as modified by Nishiwaki'250, discloses the claimed manufacturing method as relied upon above. The modified EP'146 method does not teach that the discharge port plate is formed of silicon nitride.

Muto'894 teaches that forming discharge port plates (nozzle plate 61) can be accomplished by conventional, art recognized equivalent materials of either resin or silicon nitride (see col. 25, line 55 to col. 26, line 16). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have formed the discharge port plate of WO'137, alternatively, with such conventional, art recognized equivalent materials with compositions of either resin or silicon nitride, to produce equivalent discharge port plates.

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***Response to Arguments***

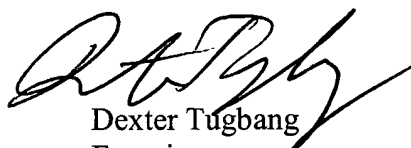
8. Applicant's arguments filed 9/10/02 (Paper No. 16) with respect to Claims 1-3 and 5-15 and the merits of WO'137 were found to be persuasive and the previous rejections drawn to WO'137 have been withdrawn.

***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dexter Tugbang whose telephone number is 703-308-7599. The examiner can normally be reached on Monday - Friday 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 703-308-1789. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3590 for regular communications and 703-305-3588 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0858.

  
Dexter Tugbang  
Examiner  
Art Unit 3729

adt  
November 25, 2002